

REMARKS

As a preliminary matter, in the Office Action mailed July 25, 2006, the Examiner did not indicate that the two references in the "Other Documents" section of the PTO-1449 form mailed June 3, 2003 were considered and made of record by initialing the corresponding box on the PTO-1449 form. The Examiner also did not indicate that this reference was not in conformance with MPEP 609. As such, applicant respectfully request that the Examiner indicate that this reference has been considered and made of record.

Office Action Rejections Summary

Claims 12, 14-17 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (U.S. Patent No. 5,949,483) in view of Yonemoto (U.S. Patent No. 5,434,619).

Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (U.S. Patent No. 5,949,483) in view of Yonemoto (U.S. Patent No. 5,434,619) and further in view of Hamasaki (U.S. patent No. 5,335,008).

Claims 18-20 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yonemoto (U.S. Patent No. 5,434,619).

Claims 22-23 stand rejected under 35 U.S.C. 102(e) as being anticipated by Fossum et al. (U.S. Patent No. 5,949,483).

Status of Claims

Claims 12-23 are pending in the application. Claims 19-22 have been amended. No claims have been added. No new matter has been added. Claim 18 has been canceled.

Claim Rejections

35 U.S.C. § 103(a)

Claims 12, 14-17 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (U.S. Patent No. 5,949,483) in view of Yonemoto (U.S. Patent No. 5,434,619). Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (U.S. Patent No. 5,949,483) in view of Yonemoto (U.S. Patent No. 5,434,619) and further in view of Hamasaki (U.S. patent No. 5,335,008).

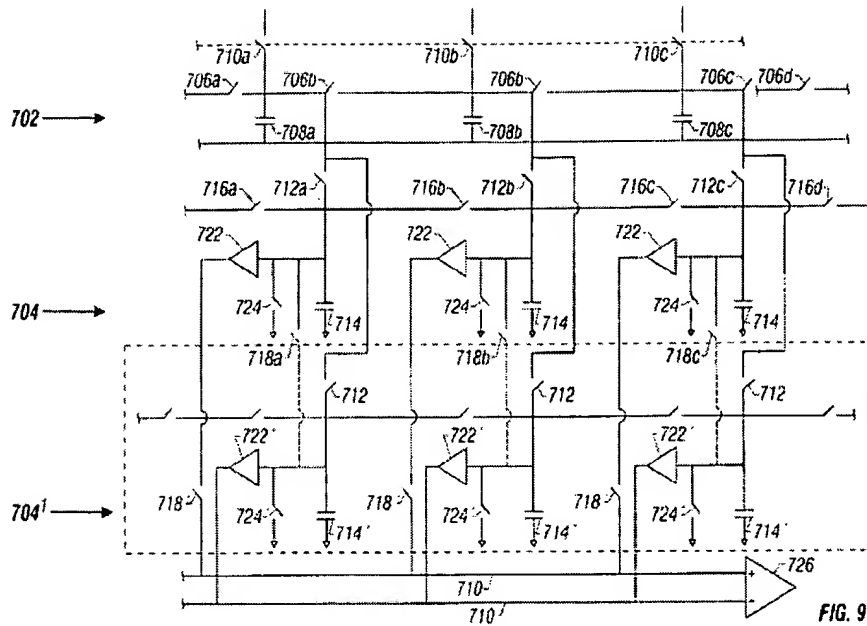
The current Office Action states:

Fossum teaches an image sensor (figure 3b), comprising an array of pixels (15) comprising: a pixel column output line coupled to the column of pixels (every pixel column output line is coupled to a column of pixels); a first switch (figure 9, switch 712a) coupled to the pixel output line; a capacitor (714) coupled to the first switch (712a); **a first crossbar switch (728) having a first input coupled to the pixel column output line and a second input coupled to the capacitor (col. 14, lines 6-20)**, wherein the first crossbar switch has a first output and a second output (a crossbar switch will have a first output and a second output).

(Office Action, 11/01/2006, page 3; emphasis added).

Applicant respectfully disagrees with the Office Action's characterization of Fossum. It is submitted that such a disclosure does not support the conclusion reached in the Office Action, and that such a conclusion is inapposite. It is submitted that in order to serve as a prior art reference rendering a claim obvious, the reference must enable that which it is asserted to make obvious. A claimed invention cannot be anticipated or made obvious by a prior art that is not enabled. *Elan Pharmaceuticals, Inc. v. Mayo Foundation for medical Education and Research*, 346 F.3d 1051, 1054 (Fed. Cir. 2003).

First, the stated "crossbar switch 728" is not shown in figure 3b, figure 9, or in any other figure of Fossum. Figure 9 of Fossum is reproduced below. As can be seen, no crossbar switch 728 is present.



(Fossum, Figure 9).

Furthermore, the location of the crossbar switch 728 relative to other elements of the image sensor of Fossum is not taught by the specification. The relevant language cited by the examiner states:

It is noted that eliminating the readout circuit 70 (of FIG. 3A) would also eliminate the previously described advantageous feature of the invention which suppresses fixed pattern noise. Readout circuit 70 had a shorting FET 116 connected across the sampling capacitors 205, 235 to reduce the noise. The fixed pattern noise can also be suppressed by employing a similar strategy in the multiresolution circuit of FIG. 9. **Crossbar switches 728 can be used in this circuit. These switches 728, when closed, connect the signal bank 704 with the reset bank 704'.** The output from the differential amplifier 726 obtained when the crossbar switches 728 are closed is subtracted from the output obtained at the end of the integration period, before the switches 728 are closed. The result is a signal which has been compensated for fixed pattern noise.

(Fossum, column 14, lines 6-20; emphasis added).

Fossum does not discuss the placement of the crossbar switch 728 relative to other elements of the image sensor, as required for enablement. Fossum only states that

crossbar switches can be used to connect the signal bank 704 with the reset bank 704'. However, this does not inform one skilled in the art where the crossbar switches 728 should be placed in the image sensor relative to row averaging section capacitors 714, buffers 722, row averaging selection switches 720, or other elements in Fossum. Nor is the relative placement of the crossbar switch 728 with respect to other elements of the image sensor discussed elsewhere in Fossum. As such, the location of the first crossbar switch 728 relative to the pixel column output line, capacitor, first column amplifier and second column amplifier is unknown.

Under *Elan Pharmaceuticals*, enablement requires that the prior art reference must teach one of ordinary skill in the art to make or carry out the claimed invention without undue experimentation. It is submitted that one of ordinary skill in the art would not be able to make an image sensor with a crossbar switch 728 without knowing its position or relationship with respect to other elements of the image sensor. Therefore, Fossum cannot be used to render the crossbar switch of claim 12 obvious.

Assuming, for the sake of argument, that 728 is a typographical error, and that Fossum intended the crossbar switch to be labeled 718a, Fossum still does not teach or suggest all of the limitations of claim 12.

Claim 12 recites an image sensor, comprising:

- an array of pixels comprising a column of pixels;
- a pixel column output line coupled to the column of pixels;
- a first switch coupled to the pixel output line;
- a capacitor coupled to the first switch;
- a first crossbar switch having a first input coupled to the pixel column output line and a second input coupled to the capacitor, wherein the first crossbar switch has a first output and a second output;**
- a first column amplifier having an input coupled to the first output of the first crossbar switch, wherein the first column amplifier has an output;
- a second column amplifier having an input coupled to the second output of first crossbar switch, wherein the second column amplifier has an output;
- a first bus line coupled to the output of the first column amplifier;

a second bus line coupled to the output of the second column amplifier;
a second crossbar switch coupled to the first and second bus lines;
and
an output amplifier coupled to the second crossbar switch.

(emphasis added).

The crossbar switches 728 mentioned in Fossum are switches that, “when closed, connect the signal bank 704 with the reset bank 704’.” (Fossum, col. 14, lines 11-20). These crossbar switches 728 have an input connected to the signal bank 704 and an output connected to the reset bank 704’. As such, the crossbar switches 728 discussed in Fossum are **single input/single output switches**. In contrast, the crossbar switch of claim 12 has a **first input** coupled to the pixel column output line **and a second input** coupled to the capacitor, wherein the first crossbar switch has a first output and a second output. Fossum does not teach or suggest a multi-input/multi-output crossbar switch, much less a crossbar switch having a first input coupled to the pixel column output line and a second input coupled to the capacitor, as required by claim 12.

Yonemoto teaches an output of a first amplifier being connected to a first input of a swap switch, and an output of a second amplifier being connected to a second input of the swap switch. (Yonemoto, col. 6, lines 49-68). In contrast, the first crossbar switch of Claim 12 has a first input coupled to the pixel column output line and a second input coupled to the capacitor. Yonemoto does not teach or suggest coupling a first input of the crossbar switch to a pixel column output line and a second input of the crossbar switch to a capacitor, as required by claim 12.

Hamasaki teaches a CCD image sensing device having an amplifying transistor and a load transistor. Hamasaki does not teach or suggest a crossbar switch, much less a crossbar switch having a first input coupled to the pixel column output line and a second input coupled to the capacitor, as required by claim 12.

None of Fossum, Yonemoto, or Hamasaki, alone or in combination, teach or suggest all of the limitations of claim 12. Therefore, the applicant respectfully requests

that the Examiner remove his rejection under 35 U.S.C. 103(a). Claims 13-17 depend from, and thus include, the limitations of claim 12. Therefore, the applicant also requests that the Examiner remove his rejections to claims 13-17 under 35 U.S.C. 103(a).

Claim 21 includes the language, “the first crossbar switch having a first input coupled to the pixel column output line and a second input coupled to the capacitor, wherein the first crossbar switch has a first output and a second output.” As noted above, none of Fossum, Yonemoto, or Hamasaki, alone or in combination, teach or suggest such a first crossbar switch. Accordingly, the applicants respectfully assert that the present invention as claimed in claim 21 is patentable over the cited references. Claims 19 and 20 have been amended to depend from claim 21. Therefore, claims 19 and 20 are patentable for at least the reasons discussed with reference to claim 21.

Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 103(a) and submit that the pending claims are in condition for allowance.

35 U.S.C. § 102(b)

Claims 18-20 stand rejected under 35 U.S.C. 102(b) as being anticipated by Yonemoto (U.S. Patent No. 5,434,619). Claim 18 has been canceled. Claims 19 and 20 have been amended to depend from independent claim 21, and are patentable as discussed above.

35 U.S.C. § 102(e)

Claims 22-23 stand rejected under 35 U.S.C. 102(e) as being anticipated by Fossum et al. (U.S. Patent No. 5,949,483).

Fossum discloses that crossbar switches can be used to connect the signal bank capacitors with the reset bank capacitors. Each of the crossbar switches disclosed in Fossum connects a single signal line (e.g., the signal line through 710a) to a single reset line associated with that signal line. Since there are multiple signal lines, multiple crossbar switches are used. However, these crossbar switches are arranged in parallel.

This parallel arrangement can be seen in the parallel placement of the first, second, and third signal lines (710a, 710b and 710c, respectively) in Figure 9 of Fossum. In contrast, the plurality of crossbar switches of claim 22 are arranged in series. Therefore, the applicant respectfully asserts that claim 22 is in a condition for allowance, and requests that the rejection under 35 U.S.C. 102(e) be removed. Claim 23 depends from, and therefore includes the limitations of, claim 22. Therefore, applicant also requests that the rejection to claim 23 under 35 U.S.C. 102(e) be removed.

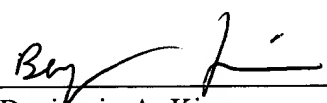
If the Examiner believes another telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Benjamin Kimes at (408) 720-8300.

If there are any additional charges, please charge our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: January 12, 2007



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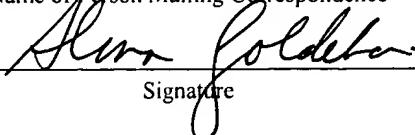
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